

1. If $f(x) = x^3 - 3x + 6$, find the following:

a. $f(-2)$

b. $f(x-2)$

2. If $h(x) = \sqrt{x-25}$, $f(x) = x-1$, and $g(x) = x^2$ find an expression for the following:

a. $(g \circ f)(x)$

b. $(f \circ h \circ g)(x)$

c. Evaluate $\frac{f(x+h) - f(x)}{h}$ if $f(x) = x^2 - 5x + 4$

3. Find the inverse of $f(x)$ if $f(x) = 3x - 8$

4. Find the inverse of $f(x)$ if $f(x) = \sqrt{3x-6}$

5. Find the slope of the line:

a. Which passes through the points (4,-4) and (-2,7)

b. Whose equation is $-7x + 4y = 12$

c. Perpendicular to a line whose equation is $y + 5 = 3(x - 3)$

d. Parallel to a line whose equation is $y = 2x - 5$

6. For each, write the equation of the line in point-slope, slope-intercept, and standard form:

a. Whose slope is 3 and which passes through (1,-4)

b. Which passes through the points (4,-4) and (-2,7)

7. Express each of the following as composites of two or more functions:

a. $7x - 2$

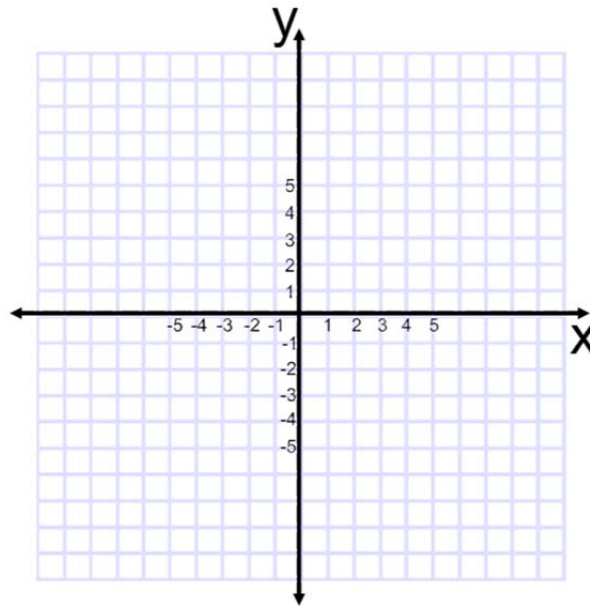
b. $\frac{12}{\sqrt{x+12}}$

8. Show that $f(x)$ and $g(x)$ are inverses of each other. $f(x) = \sqrt{x-5}$ and $g(x) = x^2 + 5$

9. Graph:

a. $f(x) = \frac{-1}{2}(x+2)$

b. $f^{-1}(x)$



10. For each of the following, simplify the expression completely. (Remember to write down any restrictions.)

a. $\frac{5k^2 - 20k}{12 + 5k - 2k^2}$

b. $\frac{5h^3}{h^2 - h}$

11. Use the geometric definition of absolute value to find the solution set to the following.

a. $|x - 3| = 5$

b. $|7 - 3x| \leq 6$

12. Perform the indicated operation(s) and simplify. (Do not forget to write the restrictions.)

a. $\frac{1 - \frac{1}{1-x}}{4 + \frac{3}{x^2-1}}$

c. $\frac{y}{2+y} + \frac{2}{3-y} - \frac{3y+1}{y^2-y-6}$

d. $\frac{a^2-ab}{ab+2b^3} \div \frac{a^2+ab}{ab+b^2}$

b. $\frac{4 - x^{-2}}{2x^{-1} - x^{-2}}$

e. $\frac{3x^2+14x-5}{2x^2-9x-5} \cdot \frac{2x^2-5x-3}{3x^2-10x+3}$

13. Solve each inequality and express the solution set in (a) set builder notation and (b) interval notation.

a. $x^2 + 9x + 14 < 0$

b. $\frac{3x}{4} \leq \frac{3x-6}{8}$

c. $\frac{x^2-3x-10}{(x-1)^2} > 0$

14. Factor each of the following completely.

a. $28x^3 - 49x^2 + 21x$

b. $2x^3 + 3x^2 - 2x - 3$

c. $75x^2 - 3$

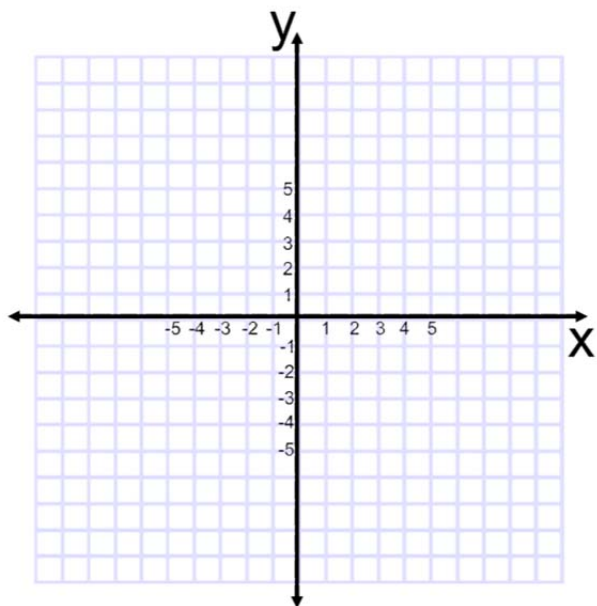
d. $8x^3 + 27$

e. $x^6 - 64y^3$

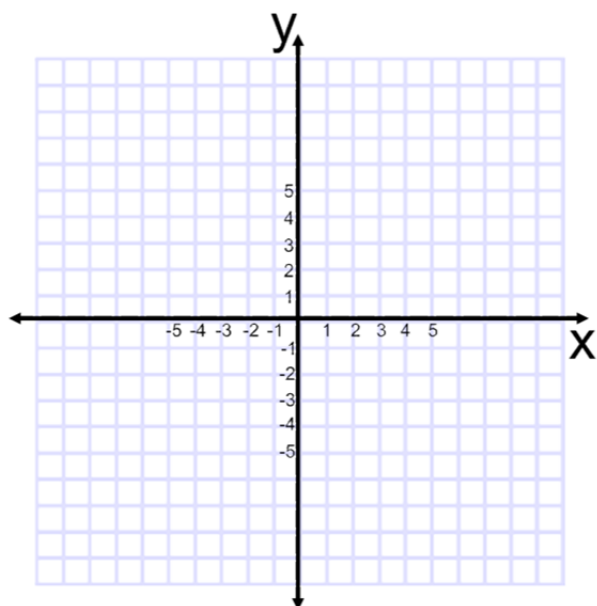
f. $x^4 - 6x^2 - 27$

15. For each, find the axis of symmetry, vertex, x-intercepts, y-intercepts and graph it

a. $f(x) = -x^2 + 5x + 6$



b. $f(x) = 2(x-1)^2 - 2$

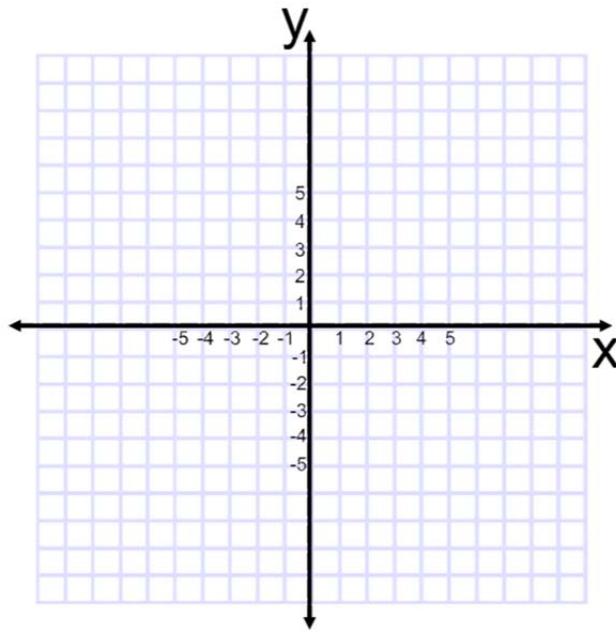


16. Write $f(x) = -x^2 + 5x + 6$ in vertex form.

17. Sketch the function **without** using a graphing calculator. Find the domain and range of each function. Evaluate the function as directed.

a. $f(x) = \begin{cases} -x^2 + 4, & x \leq 2 \\ \frac{1}{2}x - 3, & 2 < x < 4 \\ \sqrt{x-4}, & x \geq 4 \end{cases}$

Evaluate: $f(-2) =$ $f(2) =$
 $f(-1) =$ $f(4) =$
 $f(0) =$ $f(8) =$



18. Write a piecewise function that is represented by the accompanying graph of $y = f(x)$ and evaluate.

$f(-2) =$
 $f(-1) =$
 $f(0) =$
 $f(1) =$
 $f(3) =$
 $f(5) =$

